procédé présente, en photographie, des difficultés particulières, puisque pour un même instant la longueur de la corde peut varier entre des limites considérables avec la sensibilité de la plaque, la durée de pose, ou la transparence de l'atmosphère.

Toutes ces conclusions, vérifiées directement par l'expérience, sont déduites de l'hypothèse d'un planète sans atmosphère, et de l'égale intensité lumineuse des différents points du Soleil ; mais on doit reconnaître que le phénomène réel est encore plus complexe. Nous espérons pouvoir, M. André et moi, déterminer expérimentalement les modifications que la présence d'une atmosphère autour de *Vénus* amène dans les résultats auxquels nous conduisent nos premières expériences.

En résumé, l'observation photographique du passage de *Vénus* présente des difficultés au moins aussi grandes que l'observation optique ; mais on peut conserver tout espoir d'arriver par ce moyen à une bonne détermination de la parallaxe, surtout si l'on emploie les méthodes de mesure de distances de centres et d'angles de position, méthodes propres à la photographie. En tous cas, le prochain passage de *Mercure* (Mai 1878) devra être observé avec le plus grand soin, afin de vérifier d'abord sur un phénomène céleste nos conclusions, basées sur des expériences de passages artificiels, et d'assigner ensuite exactement les limites entre lesquelles les causes d'erreur signalées peuvent varier dans la nature.

A Determination of the Semi-diameter of Venus at the mean distance of the Sun from the Earth.   By A. W. Downing, B.A.

In this investigation I have made use of the results of the Washington Transit Circle Observations during the years 1866–1872 inclusive ; the Transit Circle having been brought into use in 1866, and the results of 1872 being the most recent to which I have access. During this interval the value of the semi-diameter of *Venus* at the mean distance of the Sun from the Earth, given in the American Ephemeris, and with which the Washington Observations have been compared, was 8″·546.

Let the true semi-diameter = 8″·546 $(1+y)$, so that y = coefficient of variable part of correction depending on the planet's distance ; and let x = constant part of correction arising from irradiation &c. ; we have then a series of equations of the form

$$x + y \times \text{Tab. Semi-diameter} = \text{Correction to Ephemeris.}$$

Using all the observations of vertical diameter of *Venus* made during the above-mentioned years, I have formed 167

equations in this manner; solving these by the method of least squares, I obtain the equations—

$$167x + 1636{\cdot}3y = 40{\cdot}3$$
$$1636{\cdot}3x + 23565{\cdot}24y = 239{\cdot}11\,;$$

whence

$$x = 0{\cdot}4439 \pm 0{\cdot}1036 \times e,$$

where e is the probable error of an observation, and

$$y = -0{\cdot}02068 \pm 0{\cdot}00777 \times e.$$

Therefore

$$\text{True Semi-diameter} = 8''{\cdot}546\,(1+y) = 8''{\cdot}3693 \pm 0{\cdot}0664 \times e.$$

The value $8''{\cdot}546$ was determined by Prof. Peirce from 30 observations made with the Washington Mural Circle during the year 1846.

22 *Waterloo Road, Dublin,*
    1877, May 9.

Second Catalogue of Micrometrical Measurements of Double Stars made at the Temple Observatory.   By J. M. Wilson, M.A., and G. M. Seabroke, Esq.   (Abstract.)

This Catalogue contains the measures made at the Temple Observatory during the years 1875 and 1876, and some few measures made in previous years that were omitted in our first Catalogue.

Most of the measures were made by Mr. Seabroke, Mr. Wilson having been unable to work at the Observatory during 1875 and part of 1876. Mr. Seabroke's measures were, however, frequently confirmed by those of Mr. Percy Smith. They were all made with the parallel wire micrometer, and a magnifying power of about 400 on the Alvan Clark refractor of $8\frac{1}{4}$ inches.

The Temple Observatory is now being built in a permanent form, with a Curator's house adjoining, and we take this opportunity of a break in our series of measurements to offer this second Catalogue to the Society, in the belief that double-star measures are more valuable when published at frequent intervals.

We thought it unnecessary to print the R.A. and Dec. of Struve's stars. All observers who are likely to use this catalogue will have them at hand.